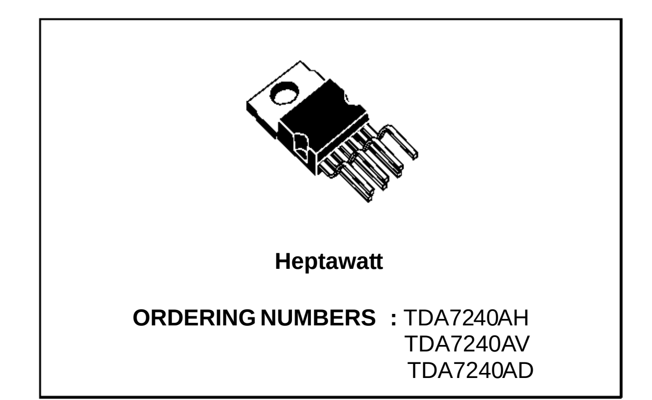


TDA7240A

20W BRIDGE AMPLIFIER FOR CAR RADIO

- COMPACT HEPTAWATT PACKAGE
- FEW EXTERNAL COMPONENTS
- OUTPUT PROTECTED AGAINST SHORT CIRCUITS TO GROUND AND ACROSS LOAD
- DUMP TRANSIENT
- THERMAL SHUTDOWN
- LOUDSPEAKER PROTECTION
- HIGH CURRENT CAPABILITY
- LOW DISTORTION/LOW NOISE



Heptawatt

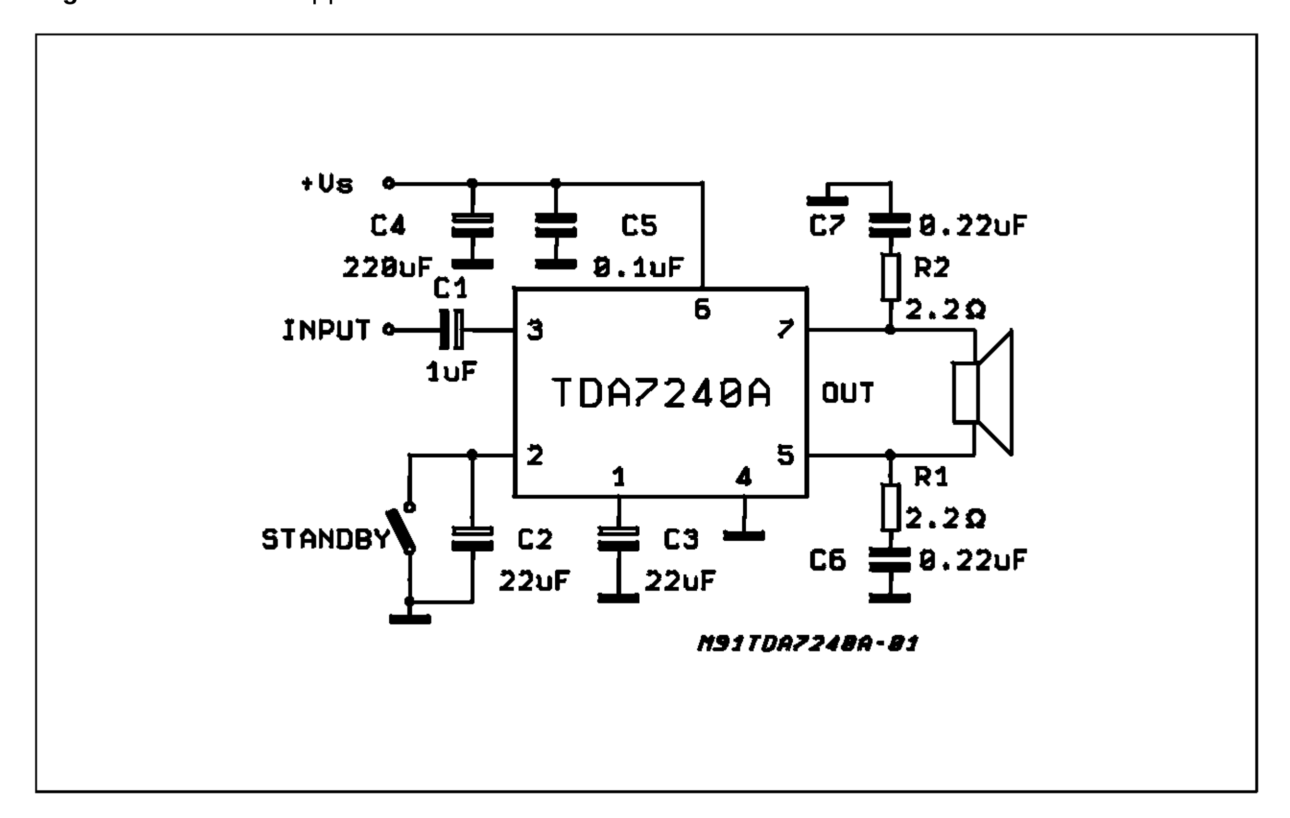
ORDERING NUMBERS : TDA7240AH
TDA7240AV
TDA7240AD

DESCRIPTION

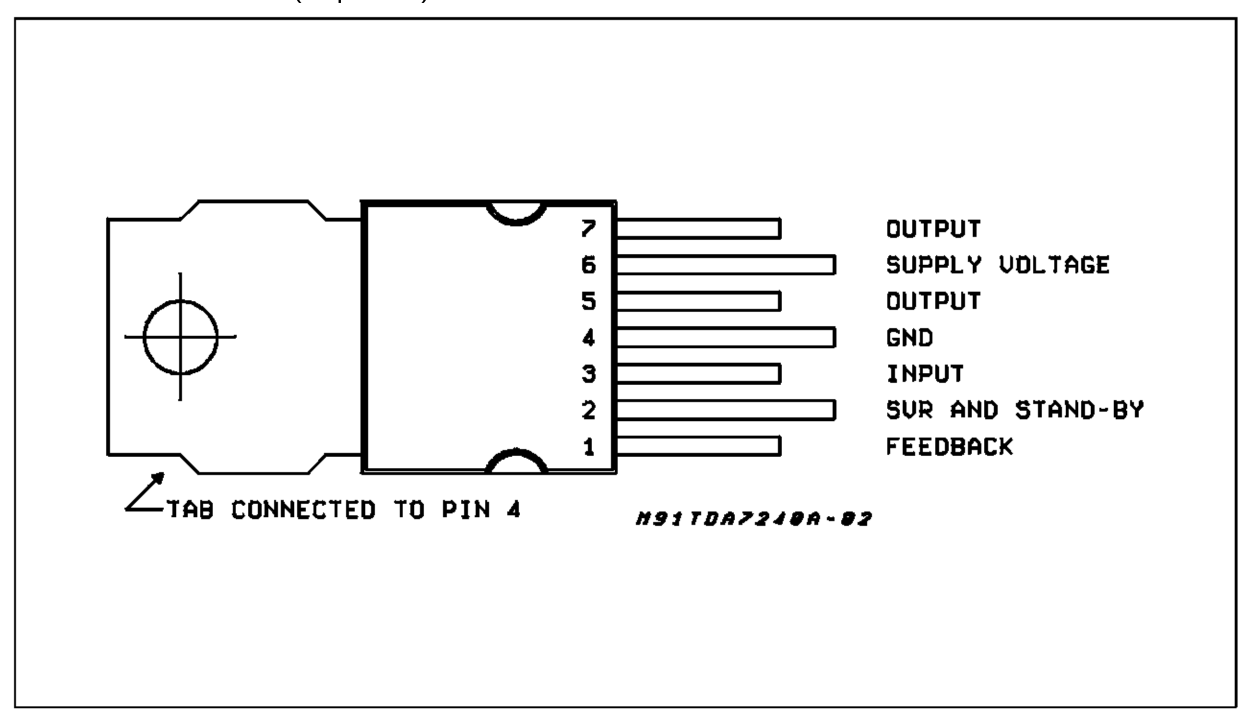
The TDA7240A is a 20W bridge audio amplifier IC designed specially for car radio applications. Thanks to the low external part count and compact Heptawatt 7-pin power package the TDA7240A occupies little space on the printed circuit board.

Reliable operation is guaranteed by a comprehensive array of on-chip protection features. These include protection against AC and DC output short circuits (to ground and across the load), load dump transients, and junction overtemperature. Additionally, the TDA7240A protects the loudspeaker when one output is short-circuited to ground.

Figure 1: Test and Application Circuit



PION CONNECTION (Top view)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	Operating Supply Voltage	18	V
V_s	DC Supply Voltage	28	V
V_s	Peak Supply Voltage (for 50ms)	40	V
I_o (*)	Peak Output Current (non repetitive t = 0.1ms)	4.5	A
I_o (*)	Peak Output Current (repetitive f ≥10Hz)	3.5	A
P_{tot}	Power Dissipation at Tcase = 85°C	16	W
T_{stg}, T_j	Storage and Junction Temperature	–40 to 150	°C

(*) Internally limited

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case Max.	4	V

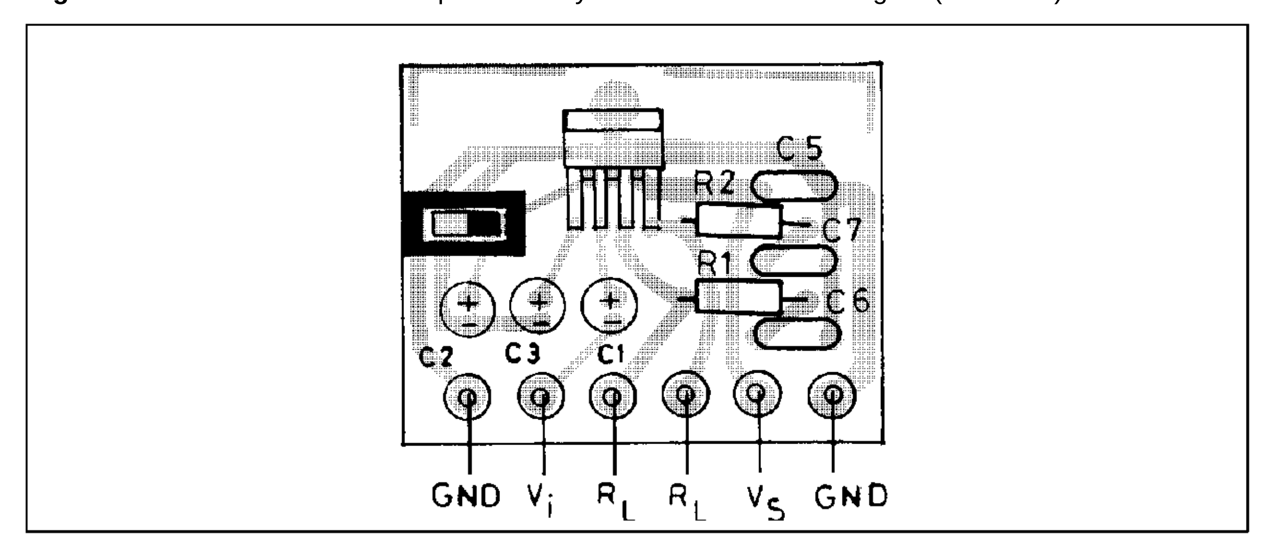


ELECTRICAL CHARACTERISTICS (refer to the circuit of fig. 1, T_{amb} = 25°C, R_{th} (heatsink) = 4°C/W, V_S = 14.4V)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_s	Supply Voltage				18	V
V_{os}	Output Offset Voltage				150	mV
I_d	Total Quiescent Current	R_L = 4Ω		65	120	mA
P_o	Output Power	f = 1kHz; d = 10% R_L = 4Ω R_L = 8Ω	 18 10	 20 12		 W W
d	Distortion	R_L = 4Ω f = 1kHz P_o = 50mW to 12W		0.1	0.5	%
		R_L = 8Ω f = 1kHz P_o = 50mW to 12W		0.05	0.5	%
GV	Voltage Gain	f = 1KHz	39.5	40	40.5	dB
SVR	Supply Voltage Rejection	f = 100Hz R_g = 10KΩ	35	40		dB
E_N	Total Input Noise	R_g = 10KΩ (*) (**)		 2 3	 10	 µV µV
η	Efficiency	R_L = 4Ω f = 1KHz		65		%
I_{sb}	Stand-by Current			200		µA
R_i	Input Resistance	f = 1kHz	70			kΩ
V_i	Input Sensitivity	f = 1kHz; P_o = 2W; R_L = 4Ω		28		mV
f_L	Low Frequency Roll Off (–3dB)	Po = 15W; R_L = 4Ω			30	Hz
f_H	High Frequency Roll Off (–3dB)	Po = 15W; RL = 4Ω	25			kHz
A_S	Stand-by Attenuation	V_o = 2Vrms	70	90		dB
$V_{TH (pin2)}$	Stand-by Threshold				1	V

(*) B= Curve A (**) B = 22Hz to 22 KHz

Figure 2 : P.C. Board and Components layout of the Circuit of Fig. 1.(1:1scale)



APPLICATION SUGGESTION

The recommended values of the components are those shown on application circuit of Fig. 1. Different values can be used, the following table can help the designer.

Component	Recommended Value	Purpose	Larger Than	Smaller Than
R1, R2	2.2Ω	Frequency Stability	Danger of High Frequency Oscillation	
C1	1µF	Input DC Decoupling	Higher Turn On and Stand-by Delay	Higher Turn On Pop. Higher Low Frequency Cutoff
C2	22µF	Ripple Rejection	Increase of SVR Increase of the Turn On Delay	Degradation of SVR
C3	22µF	Feedback low Frequency Cutoff		Higher Low Frequency Cutoff
C6, C7	0.22µF	Frequency Stability		Danger of Oscillation
C4	220µF	Supply Filter		Danger of Oscillation
C5	0.1µF	Supply Bypass		Danger of Oscillation

Figure 3 : Output Power vs. Supply Voltage.

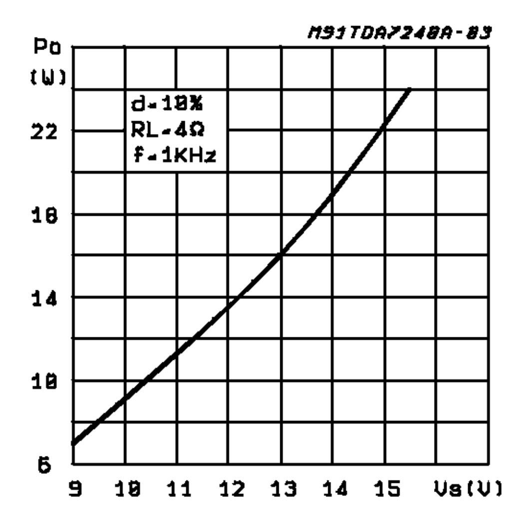


Figure 4 : Distortion vs. Output Power.

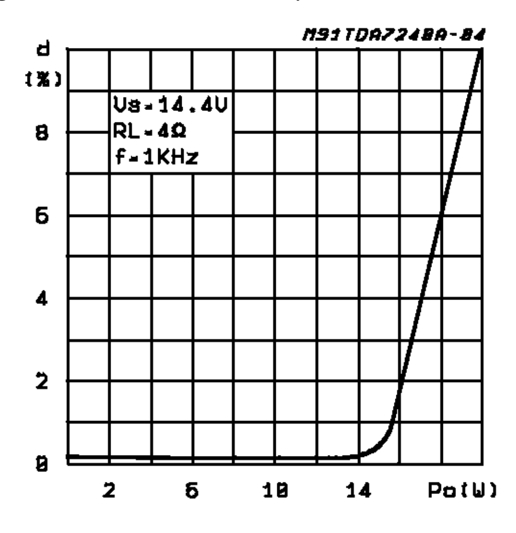


Figure 5 : Output Power vs. Supply voltage.

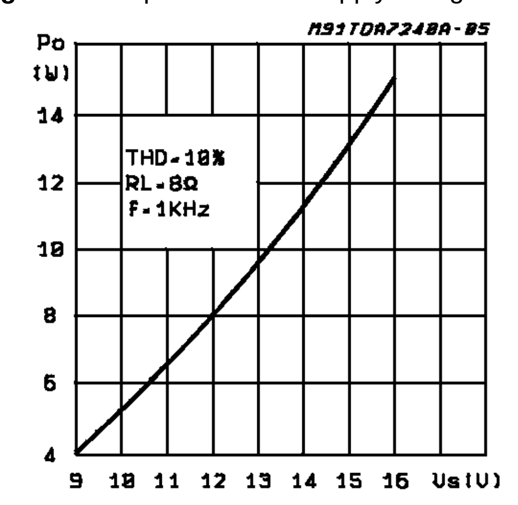


Figure 6 : Distortion vs. Output Power.

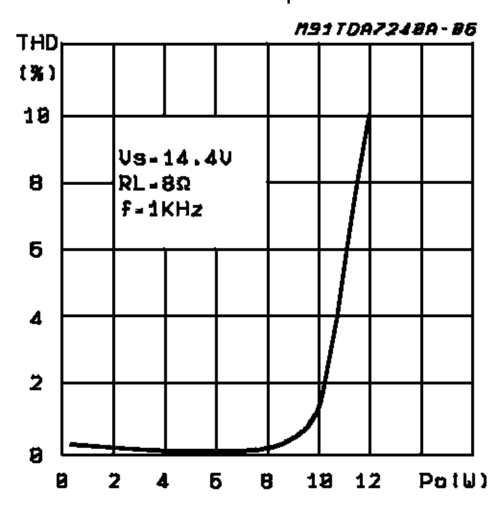


Figure 7 : Distortion vs. Frequency.

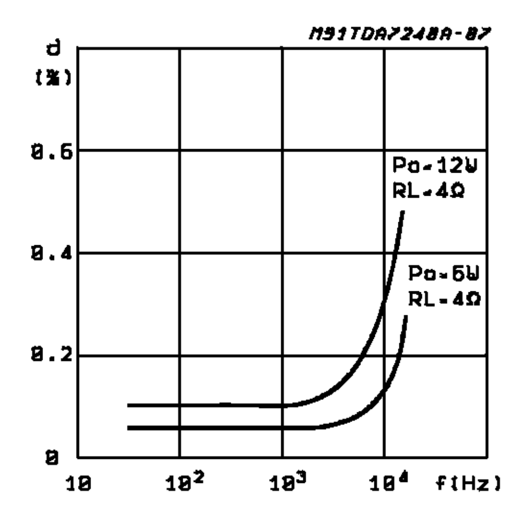


Figure 8 : Supply Voltage Rejection vs. Frequency.

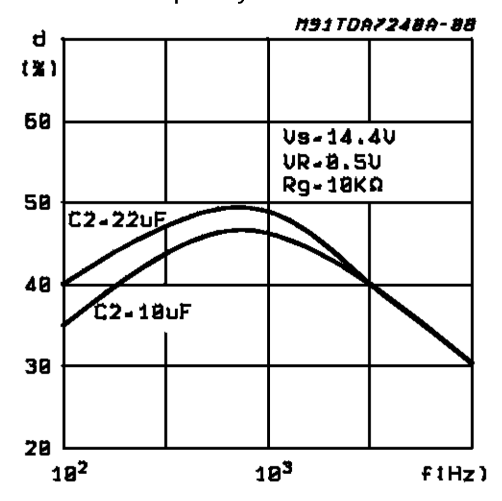


Figure 9 : Power Dissipation and Efficiency vs. Output Power.

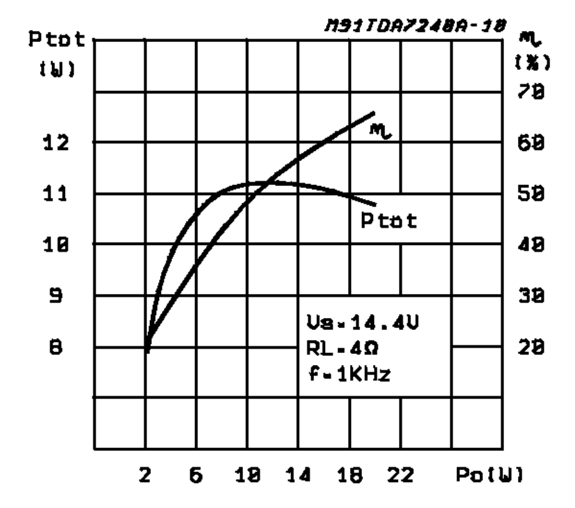
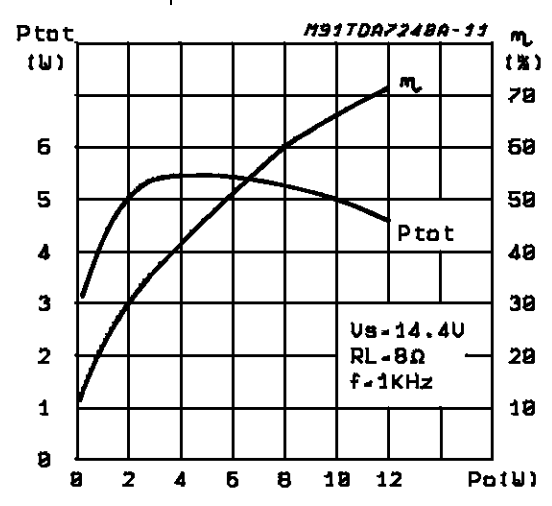
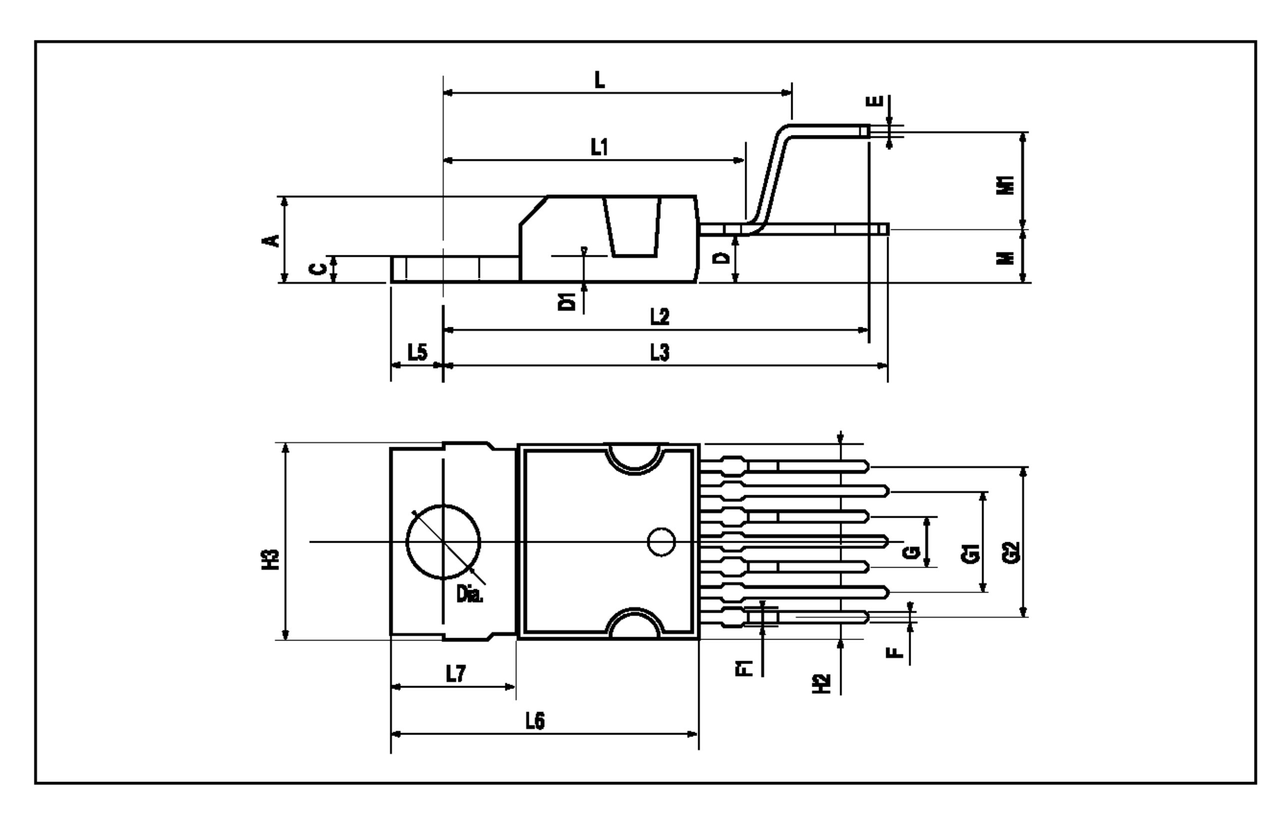


Figure 10 : Power Dissipation and Efficiency vs. Output Power.



HEPTAWATT PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.6		0.8	0.024		0.031
F1			0.9			0.035
G	2.41	2.54	2.67	0.095	0.100	0.105
G1	4.91	5.08	5.21	0.193	0.200	0.205
G2	7.49	7.62	7.8	0.295	0.300	0.307
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		16.97			0.668	
L1		14.92			0.587	
L2		21.54			0.848	
L3		22.62			0.891	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M		2.8			0.110	
M1		5.08			0.200	
Dia	3.65		3.85	0.144		0.152




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